

Generic Structure of Research Article Abstracts in Technical Education: A Move-Based Study

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Abstract

This analytical study aimed to identify the move organization and linguistic features of research article abstracts in the technical education discipline. Sixty abstracts, 30 from Journal of Industrial of Education, King Mongkut's Institute of Technology Lardkrabang and 30 from Journal of Technical of Education, King Mongkut's University of Technology North Bangkok, published between 2014-2019 were randomly selected for analysis. Hyland's move pattern (2000) was applied as an analytic framework of the study. The results indicated that the abstracts from the technical

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education field were mainly concentrated on the purpose, method, and product, which differs from the norm of abstracts proposed by Hyland's move pattern: introduction, purpose, method, product, and conclusion. Additionally, the results revealed that all of the main five moves occurred in sixty collected abstracts. Among the five moves, Purpose move was found as the most obligatory move, accounting for 100%. The following frequently found moves were Method move and Product move (98%). Conclusion move was found at 40% of the corpus. The last move which had the least frequency was Introduction move (15%). Regarding linguistic features, present tense and active voice were used in every move. The findings of the study provide insights and pedagogical implications for improving abstract writing in technical education. Recommendations are also offered for further studies.

Keywords: linguistic features, move analysis, research abstracts, technical education

บทคัดย่อ

งานวิจัยเชิงวิเคราะห์มีวัตถุประสงค์เพื่อศึกษาโครงสร้างของอัตถภาคและลักษณะทางภาษาศาสตร์ของบทคัดย่องานวิจัยทางด้านครุศาสตร์อุตสาหกรรม โดยใช้บทคัดย่อที่ตีพิมพ์ระหว่างปี พ.ศ. 2557-2562 ทั้งหมดจำนวน 60 บทคัดย่อ จากวารสารครุศาสตร์อุตสาหกรรม มหาวิทยาลัยเทคโนโลยีพระจอมเกล้าเจ้าคุณทหารลาดกระบัง จำนวน 30 บทคัดย่อ และจากวารสารวิชาการครุศาสตร์อุตสาหกรรม มหาวิทยาลัยเทคโนโลยีพระจอมเกล้าพระนครเหนือ จำนวน 30 บทคัดย่อ โดยใช้วิธีการสุ่มเฉพาะในการคัดเลือกบทคัดย่อในงานวิจัย การวิเคราะห์อัตถภาคจากทั้งสองวารสารใช้ทฤษฎีอัตถภาควิเคราะห์บทคัดย่อของ Hyland (2000) เป็นต้นแบบในการ

วิเคราะห์ ผลการศึกษาพบว่า วารสารทางครุศาสตร์อุตสาหกรรมส่วนใหญ่จะให้ความสำคัญไปที่การเขียนวัตถุประสงค์ของการวิจัย วิธีการวิจัย และการอภิปรายผลการวิจัยเป็นหลัก โดยมีความแตกต่างกับทฤษฎีต้นแบบของ Hyland ซึ่งประกอบไปด้วย 5 ส่วนหลัก ได้แก่ ภูมิหลังของการวิจัย วัตถุประสงค์ของการวิจัย วิธีการวิจัย การอภิปรายผลการวิจัย และสรุปผลของการวิจัย นอกจากนี้ผลการศึกษาแสดงให้เห็นว่าบทคัดย่อในวารสารทางด้านครุศาสตร์อุตสาหกรรมปรากฏอรรถกถาทั้ง 5 อรรถกถา ซึ่งอรรถกถาด้านวัตถุประสงค์ของการวิจัยพบในทุกบทคัดย่อ คิดเป็นร้อยละ 100 อรรถกถาด้านวิธีการวิจัยและด้านการอภิปรายผลการวิจัย พบมากเป็นอันดับ 2 คิดเป็นร้อยละ 98 อันดับต่อมาคือ อรรถกถาด้านสรุปผลการวิจัย พบร้อยละ 40 และสุดท้ายคือ อรรถกถาด้านภูมิหลังของการวิจัย ซึ่งพบเพียงร้อยละ 15 เมื่อพิจารณาในด้านของลักษณะทางภาษาศาสตร์แสดงให้เห็นว่า การใช้ปัจจุบันกาล และกรรตุวจากปรากฏในทุกอรรถกถาของบทคัดย่อ

ผลที่ได้จากการวิจัยนี้สามารถนำไปใช้เป็นข้อมูลสำหรับการปรับปรุงการเขียนบทคัดย่องานวิจัยทางด้านครุศาสตร์อุตสาหกรรม และเป็นข้อมูลเพื่อนำไปใช้กับการเรียนการสอนและการวิจัยในอนาคต

คำสำคัญ: ลักษณะทางภาษาศาสตร์ อรรถกถาวิเคราะห์ บทคัดย่องานวิจัย
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Introduction

Nowadays, research abstract writing has become a functional practice in academic writing across higher education and an abstract has been accepted to be the first gateway of a decision-making process of readers whether to accept an accompanying article or refuse it (Hyland, 2007; Lores, 2004). Thus, the need to write abstracts productively has increased in the academic context, whereby scholars are demanded to

apply this skill to publish their work internationally as part of their graduation or professional achievement. For education disciplines such as technical education, graduate students are trained to be qualified technical teachers, vocational teachers, and education administrators in both public and government contexts. They are expected not only to read a lot of academic texts but also to write their thesis abstracts in English. However, proficiency in English, specifically in abstract writing, among academicians who are non-native speakers, is generally difficult to acquire because of the complexity of tasks involved; abstract writing requires sound knowledge of the principles of summarizing and defining macrostructures (Cross & Oppenheim, 2006). This, as well as the lack of sufficient knowledge of rhetorical structure and linguistic convention regarding lexical, syntactical, and pragmatic choices, contributes to the writing barriers for inexperienced non-native writers including Thai scholars (Curry & Lillis, 2004; Flowerdew, 2001; Wannarak & Amnuai, 2016). Accordingly, the effective way in the researcher's view is to examine the genre organization and linguistic features in the disciplines that those non-native speakers are studying.

To be able to write academic research abstracts, one of the solutions recommended by scholars is move analysis. This perspective can help non-native speakers to achieve linguistic features, conventions and functions of texts and provide supportive discourse blueprints for writing instructors (Bhatia, 2002). Martin (2003) suggested that raising awareness and command of textual organization and linguistic features can stimulate novice writers to deal with problems of producing an efficient abstract. Based on observing and reviewing of previous literature, more studies have been conducted on move analysis in terms of the rhetorical structure of research article abstracts in various

disciplines such as medical science (Zhao & Wu, 2013), science and engineering (Kanoksilpatham, 2009, 2013), wildlife and conservation biology (Samraj, 2002), linguistics and applied linguistics (Doro, 2013; Pho, 2008), and management and marketing (Li & Pramoolsook, 2015); but only few studies on the same topic have been conducted in the area of education including technical education. The important reason why abstracts in the field of education deserve to be investigated is that according to Zhang and Wannrark (2016), they are comprised of groups specializing in a wide range of areas such as science education, engineering education, language education. Because of this reason, study on abstracts in education field is still needed. Accordingly, the area of technical education is selected as the focal point of this investigation.

Moreover, it is important to examine the linguistic features of a particular genre. Bhatia (1993) and Santos (1996) proposed that different moves serve different purposes and thus require different linguistic features to realize those purposes. Among the linguistic features, verb tenses and voices with their usage are two important factors any writers have to best choose to express their detail in each move. However, research on what tenses and voices with their usage occur in each move of the education abstracts has never been carried out. The present study, therefore, aims to fulfill those gaps among the previous studies mentioned earlier by investigating the rhetorical structure and linguistic realization of research abstracts in technical education discipline from Thai journals. Hopefully, the findings obtained from this study can provide researchers, especially those in the area of technical education, who write abstracts in English for national and international journal publishing, with comprehensive guidance to

develop their skill in English for writing research abstracts in order to be accepted and be able to enter the academic community of which they want to be a member.

Objectives

This preliminary study is an attempt to investigate the rhetorical structures and linguistic realization of research abstracts in technical education published in Thai journals. The research questions are as follows:

1. What are the rhetorical structures of research article abstracts published in the field of technical education?
2. What is the linguistic realization of each move in research article abstracts published in the field of technical education?

Theoretical Framework

Hyland's (2000) model of the abstract section was adopted as an analytical framework of the present study (See Table 1). According to Hyland's framework, an abstract consists of five main moves, including Introduction, Purpose, Method, Product or Results, and Conclusion. The reason for selection of Hyland's framework as a main domain was due to the fact that Hyland's move classification pattern has been widely used to capture abstracts in other academic disciplines by researchers from different countries around the world because his empirical work was derived from 800 journal abstracts from eight disciplines namely, sociology, marketing, philosophy, applied linguistics, biology, electronic engineering, mechanical engineering, and physics. One major interesting of this framework is remarked by Suntara and Usaha (2013) in that the applicability of this analytic framework is quoted to be more forceful to address abstract rhetorical move structure in comparison to

other taxonomies. With this concern, Hyland's framework can be much more universally applied to the field of technical education.

Table 1

A Classification of Hyland's Abstract Move Pattern

Moves	Function
Introduction	Establishes the context of the paper and motivates the research or discussion
Purpose	Indicates the purpose or hypothesis, outlines the intention behind the paper
Method	Provides information on design, procedures, assumptions, approach, data, etc.
Product (Results)	States the main findings, the argument, or what was accomplished
Conclusion	Interprets or expands the results, draws inferences, points to wider implications

Research Methodology

Corpus of the Study

The corpus in this study were selected from the TCI-Thaijo.org database, which has been designed by Thai Journal Online, Thailand. This database includes research articles submitted by both Thai and foreigner scholars in electronic PDF files. Before selecting the data, the researcher narrowly searched with keywords that focused on only the area of technical education. The keywords included “ Technical Education,” “ Industrial Education,” “ Vocational Education,” and “Engineering Education.” It was found that only two Thai universities

offer an academic journal with a focus on the technical education field. One is King Mongkut 's Institute of Technology Lardkrabang (KMIT), offering Journal of Industrial of Education and the other is King Mongkut's University of Technology North Bangkok (KMUT) with its Journal of Technical Education. There are two reasons for looking at the two journals in this study. Firstly, these two journals are of similar academic discipline and rated at the national level. The other reason is that Journal of Industrial of Education and Journal of Technical Education are ranked in the first and second tier of Thai Journal Citation Index (TCI) respectively. Therefore, they can be good samples of technical education abstracts published in Thai journals. These abstracts were written in Thai and then translated into English. The time range was limited to six years (2014-2019). With the criteria set for sampling procedures, all of the abstracts were selected by using simple random sampling in case there is more than one article published weekly. In total, there were 60 abstracts from two journals including 30 abstracts from Journal of Industrial Education, King Mongkut 's Institute of Technology Lardkrabang and 30 abstracts from Journal of Technical of Education, King Mongkut's University of Technology North Bangkok.

Analysis Procedure

The qualitative analysis of the corpus was carried out in two phases. The first stage was the identification of structural moves and linguistic features found in the corpus. At the beginning of corpus analysis, the move analyses of the abstracts were extensively identified in accordance with the framework of Hyland (2000) for determining rhetorical structures. In this phase, each abstract was hand-tagged on the coding system in order to identify and categorize the moves according

to name of journals. All sets of corpora were labeled from RA1 to RA60 which indicate the number of research abstracts of the study. As for move analysis coding system, I stands for Introduction, P for Purpose, M for Method, Pr for product, and C for Conclusion respectively. After each move was analyzed, sets of linguistic features namely verb tense and voice characterizing the structure of each move were systematically interpreted. The present study intended to analyze two linguistic features which are active voice and passive voice, and verb tenses. In this case, an individual move was analyzed according to these linguistic features. Verb tenses and active voice and passive voice were interpreted manually by the researcher. However, some forms of verbs were not highlighted when analyzing verb tenses such as non- finite verbs, infinitive, gerund, present participle, past participle, and perfect participle.

The second stage was conducted after the completion of the move and linguistic features analysis. This stage involves the justification of coding scheme by using inter-rater reliability method because some moves still tend to be vague and have no clear scopes among them. In order to increase the accuracy of move analysis, two experts in the field of language education are invited to analyze the text as inter-raters of this study. One is a Thai who teaches academic writing at undergraduate level and has experience in reading academic papers. The other is a native speaker of English and an expert in the area of English for Specific Purposes (ESP). Both raters are experienced in genre analysis, which may lead to subjective results with high reliability. Before text coding process, the inter-raters were trained by the researcher on how to identify rhetorical moves of the abstract promulgated by Hyland (2000), and how to code each abstract, in order

to make sure that they could work individually and avoid the anticipated difficulties or questions. After the raters became familiar with the move identification delineated by Hyland (2000), the researcher checked whether they clearly understood the analytic framework by piloting them with twenty photocopies of sample journal article abstracts which were randomly chosen from each journal. Then, the researcher and raters discussed, scrutinized and clarified the different coding in order to adjust and work out about the appropriateness of the analysis of the coding scheme from the abstracts.

In the next stage, all the coded moves agreed on by the inter-raters and the researcher were calculated for the Coefficient of Reliability formula in order to crosscheck the reliability of this present modified framework. The result of the inter-rater reliability was 85.2%, meaning that this analytic framework was highly reliable (McHugh, 2012). To this end, all data of moves were grouped by using the cut-off point proposed by Kanoksilpatham's (2005) classification. Following her criterion, if a move appears in all texts in a corpus (100%), it is considered as obligatory; if the appearance of the move ranges from 60-99 %, it is categorized as a conventional move. In contrast, if the appearance is lower than 60%, it is regarded as an optional move. The criterion was employed to examine whether a move in the research abstracts in diverse academic areas is obligatory, conventional, or optional by recording the frequency of a particular move. After completing each data analysis, the collected frequency of the moves, verb tenses, and passive and active voices were changed to percentages by applying the quantitative formula.

Findings

Table 2

Move Frequency of the Abstracts in the Field of Technical Education

Moves	Number	Percentage
Introduction (I)	9	15%
Purpose (P)	60	100%
Method (M)	59	98.33%
Product (Pr)	59	98.33%
Conclusion (C)	24	40%

As shown in Table1, five moves were found from the analyzed 60 abstracts. The numerical data display that the Purpose move gained the highest percentage (100%) while the Introduction move gained the lowest percentage (15%). Based on the cut-off point of 60%, the abstracts had one obligatory move, Move 2: Purpose, and two conventional moves: Move3: Method and Move 4: Product, because their frequency of occurrence was over 60% of the time in the entire corpus with the percentage of 100% and 98.33% respectively. In addition, there were two optional moves, Move 1: Introduction and Move 5: Conclusion, since they occurred lower than 60% in the corpus. According to this result, it can be summarized that these three moves are indispensable part of abstracts written by Thai scholars.

Table 3

Move Sequence of the Abstracts in the Field of Technical Education

Pattern	Number of Occurrence	Percentage
P-M-Pr	31	51.66%
P-M-Pr-C	13	31.66%
I-P-M-Pr	5	8.3%
I-P-M-Pr-C	3	5%
I-P-M-C	2	3.3%

Abbreviation: I=Introduction, P=Purpose, M=Method, PR=Product, and C=Conclusion

As presented in Table 3, there were five distinct move sequences in the dataset of abstracts in the corpus of the current study. Each of these move patterns included a set of sequential moves ranging from three to five moves. The two most frequently linear move patterns were P-M-Pr (51.66%, 31 abstracts), followed by P-M-Pr-C (31.66%, 19 abstracts) in which introduction move was missing. It is interesting here that Move 2: Purpose was more frequently used as an opening move than Move 1: Introduction because Move 2 was used as an opening move in 60 abstracts (100%) in 5 patterns, whereas Move 1 was used as an opening move in 9 abstracts (15%) in 3 patterns.

Table 4
Frequency of Voices Found in the Abstracts in the Field of Technical Education

Voice	Move1	Move2	Move3	Move4	Move5	Total	Percentage
Active	7	59	49	46	14	175	83.73%
Passive	2	1	10	13	8	34	16.27%
Total	9	60	59	58	24	209	100%

According to Table 4, there were 209 voices exhibited in the corpus. The active voice units appeared five times more than the passive voice ones. The active voice usage appeared at the percentage of 83.73%(175 out of 209 instances), meanwhile the rate of passive voice structure was found only at 16.27%(34 out of 209 instances).

Table 5
Frequency of Tenses Found in the Abstracts in the Field of Technical Education

Verb Tense	Move1	Move2	Move3	Move4	Move5	Total	Percentage
Present tense	4	39	15	20	17	111	52.62%
Past tense	2	18	41	36	4	85	40.29%

Verb Tense	Move1	Move2	Move3	Move4	Move5	Total	Percentage
Present tense + Past tense	1	3	3	2	-	9	4.27%
Future tense	-	-	-	1	1	2	0.94%
Perfect tense	2	-	-	-	-	2	0.94%
Present tense + Future tense	-	-	-	-	2	2	0.94%
Total	9	60	59	59	24	211	100

In terms of the preference of using verb tenses in research abstracts in the technical education field. The results demonstrated that the present tense was the tense that most frequently occurred in Move 1: Introduction, Move2: Purpose, and Move 5: Conclusion. On the other hand, the past tense was frequently used in Move3: Methodology, which explains the approach or process of doing research. With a closer look at the use of double-tense, there were 9 abstracts in which both present tense and past tense were used and 2 abstracts in which present tense and future tense were used. It is clear that writers of the abstracts in this study preferred using the present tense to combine with other tenses depending on the purpose of each move.

Discussion

What are the rhetorical structures of research article abstracts published in the field of technical education?

Based on the findings mentioned above, Move 2: Purpose is viewed the most frequent one with 100%, followed by a 98% occurrence of Move 3 and Move 4 (Method and Product) in the technical education abstracts. The three high frequent moves were in accordance with the contextualized studies on research abstracts (Brionse, 2018; Darabad, 2016; Li, 2011; Suntara & Usaha, 2013; Tseng, 2011) which all claimed that the rhetorical structures including Purpose, Method, and Product covered almost a quarter of the move patterns in the research abstracts. As expounded upon in Cross and Oppenheim (2006), and Pho (2008), those three common moves are deemed conventional moves of the genre and displayed in almost all abstracts because they provided most of the information on the aim of research, the procedure used, and the gained results. Without these three moves, readers may not know the objectives, procedure, and results of research. This could explain why the high frequency three moves were Move 2, Move 3, and Move 4. This implies that the scholars realized the importance of these three moves.

Moreover, the foregrounding here is that in the corpus of this study, Move 1: Introduction and Move 5: Conclusion are recognized as optional move since they appear less than 60% of the time in the entire corpus. This finding is in line with the previous researches (Chen & Kou, 2012; Ebadi et al., 2019; Ren & Li, 2011; Zand-Moughadam & Meihami, 2016) in which Introduction and Conclusion moves were

presented in low frequencies among novice writers. The absence of two crucial moves can be explained by other two reasons. The first one is probably due to the hypothesis that the limited space of abstract in which the authors usually need to concentrate more on the explanation of purpose, methods, and findings rather than to pinpoint their background knowledge. That is, the authors tend to leave out this part that they perhaps think that it is not quite important to write in the abstract because their readers may read the overall content in the introduction of an article if that abstract contains interesting detail. The second possible reason may be that some abstracts have several objectives and findings. Thus, a specific conclusion is applied to harmonize each objective or finding or conclusion which are left last until all the objectives or findings are stated first.

The second content of this research question asked about the rhetorical move patterns employed in research abstracts in the technical education discipline published in Thai journals. The results indicated that P-M-Pr was the most preferred move structure in the technical education field. This is in line with Amnuai (2019), who indicates that the most frequent preference pattern among the authors in accounting was a P-M-Pr pattern. This finding confirms Hyland (2000) who recommended that in general, these three moves of the research should be stressed in an abstract as the dominance sequence. This means that Thai writers consider the purposes, methods, and results as the significant domain when writing the abstract in English. So, they control their abstracts without situating their works in the context of the research world, as can be seen from the low frequency of occurrence of Move 1: Introduction, which is different from the writers in the international context asserted in Amnuai's (2019) study that they were systematically

conducted to begin their abstracts with introduction move and ended the abstracts with conclusion move as the pattern of P-M-Pr-C.

The last issue that deserves attention is move cycling. From the findings, no cycling move appeared in the abstracts because the ordering pattern of the corpus proceeds from one move to another. This means that the moves which have already been used are not usually replayed. One possible reason for the lack of this pattern may be the required text length of fewer than 150 words standardized by two Thai journals in this study. For this limitation, it is not easy that writers present move cycles with the limited number of words by highlighting all parts in abstracts. Another reason is that Thai researchers tend to respect the prescribed regulation of abstract writing. Consequently, they appear to have more direct and linear order. This finding is consistent with the results from the comparative move analysis by Pasavoravate (2011). There is a lower degree of cyclicity of moves in Thai abstracts (3 out of 35 abstracts in the corpus, amounting to 8.57%) than in international abstracts (20 out of 35 abstracts of the corpus, amounting to 57.14%). Based on the result, it can be seen that the organizational patterns of the abstracts in this study seem to be more linear and systematic form.

What is the linguistic realization of each move in research article abstracts published in the field of technical education?

To address this research question in terms of voice and verb tense used in the corpus, it was found that technical education scholars tended to use active voice in their abstracts more than passive voice in all the five moves examined. This finding was partly similar to that of the previous study by Kearttikul and Wimolkasem (2017), and

Nurhayati (2017) revealing that active voice was the most dominant among all the five moves of research article abstracts, while passive voice was used more in Method move. One interesting observation is that the kind of research context may be one of the factors contributing to the result in the frequency of voice usage in the abstracts. For the corpus in this study, most technical education studies are action research and because of this, there is more information on the interpretation of the purpose, research procedure, and results to be presented as active voice, focusing on things or persons who are doing some actions. For this reason, it is fair to say that Thai authors in Thai corpus heavily tended to stay as an active role as possible when they reported the goals, methods, results, and conclusions of their studies.

In addition, the analysis of verb tenses usage in the corpus shows that the present tense was the frequent tense used in Move 1 (introduction), Move 2 (purpose), and Move 5 (conclusion) in order to make reference to established knowledge, and to state the implications of the study and needs for further study. It can be stated that the scholars in this study want to show that their research is a current trend. Apart from this, the past tense was frequently used in Move 3 (method), and Move 4 (product). The use of past tense, specifically in the Method and Product moves, implies that the authors consider that the information about research methodology and results is likely to be true and can be contextualized with the completed process period.

When comparing the results of the current study with those of Saeew and Tangkiengsirisin (2014), Salager-Meyer (1992), and Tseng (2011), similarities and differences can be found. For example, in the above mentioned studies, the present tense was used in Move 1 (introduction) and Move 5 (conclusion), and the past tense was used in

Move 3 (method), and Move 4 (product). However, in Saeew and Tangkiengsirisin (2014), Salager-Meyer (1992), and Tseng (2011), Move 2 (purpose or aim) was reported in past tense, while in this investigation Move 2 was reported in present tense. The possible explanation for this difference is some disciplinary variation (i.e; medicine, linguistics, environmental science, and technical education) regarding verb tense usage in writing abstracts. This phenomenon elucidates Swales and Feak's (2004) work that "there appears to be considerable disciplinary and individual tense variation with sentences dealing with results." (p.283). That is to say, there is disciplinary variations based on tense usage in the writing of research abstracts, specifically in the purpose section. Moreover, present perfect tense was another interesting finding of the verb tense used in the corpus. Present perfect tense was found to be the less concerned tense, accounting for 0.94% of the total number of the tenses. This finding is similar to the conclusions drawn by Hanidar (2016) who conducted tense and voice usage in research abstracts selected from four academic areas and found that the perfect tense seemed to be the least used tense in the writing of abstracts both in active and passive forms. The reason behind the least used may be the limited ranges of words needed in the abstracts and the writers' style when introducing the contents of the first part of abstracts.

Conclusion

The present study was carried out to investigate the rhetorical structures and linguistic realizations occurring in research article journal abstracts of the technical education discipline. Sixty abstracts selected from two Thai journals were analyzed in two phases: move identification and coding scheme.

The findings revealed that the corpus consisted of one obligatory move (Move 2: Purpose), two conventional moves (Move 3: Method and Move 4: Product), and two optional moves (Move 1: Introduction and Move 5: Conclusion). With regard to linguistic features, it is noticeable that verb tenses were typically applied in general moves on the basis of their functions and communicative purposes. Besides, there were more active voice units than passive voice ones. To sum up, based on the results of the study, it is manifested that an abstract in technical education discipline is composed of several moves like an abstract published in other disciplines. Additionally, the author's speculation to use different linguistic features (i.e. verb tense and voice) depended on the communicative purpose of each move. Moreover, the general move ordering pattern regarded to be the dominant sequential order was P-M-Pr (Purpose-Method-Product) which is one of the interesting patterns found in genre analysis of the technical education abstracts.

The results of this investigation can provide comprehensive knowledge for teaching of abstract writing, especially to non-native speakers of English like Thai scholars. This is because it can yield a better understanding of both structural moves and linguistic features in order to produce effective research abstracts. In other words, language instructors would be able to broadcast their comprehensions on the functions of each rhetorical move, and the necessary linguistic features of research abstracts so that they could train their learners on how to write the abstract successfully; not only how to move the text in the abstract, but also how to integrate the linguistic characteristics into each move.

Recommendations for Further Study

There are four limitations to be discussed in this study. First of all, the study presents the generic move structure of the abstract and the linguistic features in terms of verb tense and voice related to the purpose of each move. Therefore, the results can be beneficial particularly for writing of only research abstracts. To cover the overall pictures of research articles in technical education field, further study should analyze moves and steps in other parts including introduction, methodology, discussion, and conclusion in technical education field together with other linguistic characteristics such as modality, personal pronouns, discourse markers, and lexical bundles.

Besides, this study emphasized research abstracts published in Thai context only. Overseas research abstracts were not addressed. Furthermore, the target discipline of this study was only technical education. Therefore, further study is suggested in order to compare the similarity and difference of abstracts written by non-native speakers like Thai with those written by native speakers, especially in other disciplines. The findings from comparative studies would facilitate more comprehensive explanations of the research abstracts presented in diverse contexts, and raise more awareness on the disciplinary variation of the writers in different disciplines.

Added to that, writers' perception was not mentioned in this study. How writers write, what they think about organizational form of abstracts, and what barriers they face are viewed as important factors upon their academic achievement. Data gathered from writers' perception can be a significant blueprint for the development of language practitioners who are required to prepare courses such as academic writing courses, English for academic purposes courses, or other training courses. Hence, further studies need to focus on this issue by applying qualitative data such as in-depth interviews, and think-aloud protocols.

Finally, another important feature that this study did not show is the move cycling which is found to be an omitted pattern in the

corpus. For this aspect, it would be beneficial to investigate the repetition of move structure in other genres of the technical education discipline, both written and spoken genres. This would provide comprehensive understanding of the rhetorical organization of the technical education discourse community.

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